

# Menarche age in Iran: A meta-analysis

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## ABSTRACT

**Background:** Research shows that the age at menarche, as an essential element in the reproductive health of women, had been decreasing in the 19<sup>th</sup> and 20<sup>th</sup> centuries, and shows a huge variation across different countries. There are numerous studies performed in Iran reporting a range of age at menarche. Thus, this meta-analysis aimed to determine the overall mean age at menarche of the girls in Iran.

**Materials and Methods:** All relevant studies were reviewed using sensitive and standard keywords in the databases from 1950 to 2013. Two raters verified a total of 1088 articles based on the inclusion criteria of this study. Forty-seven studies were selected for this meta-analysis. Cochran test was used for samples' homogeneity (Tau-square). The mean age at menarche of the girls in Iran with 95% confidence interval (CI) from the random effects was reported.

**Results:** The homogeneity assumption for the 47 reviewed studies was attained (Tau-square = 0.00). The mean (95% CI) menarche age of Iranian girls from the random effects was 12.81 (95% CI: 12.56–13.06) years.

**Conclusions:** The results of this study showed that mean age at menarche was less than that of some European developed countries such as Switzerland, Sweden, and Denmark, more than that reported in some countries such as Greece and Italy, and similar to the values obtained in the United States of America and Colombia. Lower age at menarche in Iran may be largely attributed to the changes in lifestyle and diet of the children.

**Key words:** Menarche, meta-analysis, Iran

## INTRODUCTION

Menarche is one of the significant events in the lives of women. The cultural, social, and epidemiological importance of this biological incident has led many epidemiological studies to investigate this incident and the factors affecting it.<sup>[1]</sup>

A significant decrease in the age at menarche has been demonstrated in the 19<sup>th</sup> and 20<sup>th</sup> centuries.<sup>[2-4]</sup> In the 19<sup>th</sup> century, the factors that seemed to be effective on the age at menarche were climate, race, social status, urban and rural residence, physical activity, education,

sexual arousal, genetics, and health status.<sup>[5,6]</sup> Meanwhile, in the studies conducted in the 20<sup>th</sup> century, some other factors such as the season and month of birth, birth order, family income, occupation and education of the parents, and family size were considered for the occurrence of menarche.<sup>[5,7]</sup>

Other factors that lead to decrease in the age at menarche according to reports are childhood obesity,<sup>[8,9]</sup> lack of a father in the family during early childhood, disrupted and stressful family relationships, low birth weight, being a single child, non-white race, history of preeclampsia in the mother, smoking exposure, lack of breast feeding, and lack of adequate physical activity in childhood.<sup>[10]</sup>

However, other factors such as increased number of family members, warm and friendly relationship of the girl with her father, safe and stress-free atmosphere of the family, having older siblings, low education of the families and the children (because of the imposed physical work from an early age to earn money), and heavy exercises to reduce body fat are the other factors that may delay the age at menarche.<sup>[10]</sup>

Early or late onset of menarche is associated with substantial morbidity in women's lives over the coming years. For example, the effects of early menarche (before age 12) include short stature;<sup>[4,11]</sup> obesity;<sup>[12]</sup> diabetes type II; cardiovascular diseases; hypertension; breast, endometrial,

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